

MEMORANDUM

December 17, 2019

TO: Michael Love
Assistant Superintendent, Career Readiness

FROM: Carla Stevens
Assistant Superintendent, Research and Accountability


SUBJECT: **CAREER AND TECHNICAL EDUCATION: ENROLLMENT, PERFORMANCE, GRADUATION, AND DROPOUT, HISD, 2018–2019**

Career and technical education (CTE) is a state-mandated course option offered to Houston Independent School District (HISD) secondary school students. It includes dual credit CTE courses and is designed to prepare students for high-demand occupations. CTE is offered either as a coherent or non-coherent sequence of courses from 16 career clusters that lead to an associate or a baccalaureate degree and beyond, and an industry-recognized certificate and/or licensure. CTE uses work-related learning, education, and training based on written agreements with business and industry training partners, and practicums from which career pathways can be developed. This report focused on CTE student enrollment, performance, graduation, dropout, and certification. The evaluation was guided by four questions and used descriptive statistics to report findings.

Key findings include:

- There was an increase in the number of students who were enrolled in a coherent sequence of CTE courses between the 2017–2018 and 2018–2019 school years.
- A higher percentage of students who were enrolled in a coherent sequence of CTE courses were either Black (26.3% vs. 21.7%) or Hispanic (64.1% vs. 61.4%), G/T (17.5% vs. 13.3%) and economically disadvantaged (74.9% vs. 67.6%) when compared to their peers who were enrolled in a non-coherent sequence of CTE courses.
- Most students who were enrolled in a coherent sequence of CTE courses performed at or above the Approaches Grade Level standard, between 64.0 and 91.9 percent, on all five of the 2019 State of Texas Assessments of Academic Readiness (STAAR) End-of-Year (EOC) exams. They also outperformed students who enrolled in a non-coherent sequence of CTE courses on four of the five STAAR EOC exams.
- A higher percentage of students who were enrolled in a coherent sequence of CTE courses performed at or above the Approaches Grade Level standards on all five of the 2019 STAAR EOC exams compared to the performance of their peers on the 2018 exams.
- Compared to the district, a higher percentage of CTE students from the class of 2018 graduated from HISD and the number of CTE students who graduated from that class over the class of 2017 increased by 48.5 percent compared to 4.8 percent for the district.
- Among ninth- to twelfth-grade students, HISD had a higher dropout rate (4.3%) compared to the dropout rates for students who were enrolled in CTE course (2.6%) for the 2017–2018 school year.
- On average, participating schools had a certification pass rate of 82.7 percent during the 2018–2019 school year. Of these schools, six had pass rates of 100 percent and four performed below the average.

Further distribution of this report is at your discretion. Should you have any questions, please contact me at 713-556-6700.

 CJS

Attachment

cc: Grenita Lathan
Silvia Trinh
Rick Cruz
Montra Rogers



RESEARCH

Educational Program Report

**CAREER AND TECHNICAL
EDUCATION: ENROLLMENT,
PERFORMANCE, GRADUATION,
AND DROPOUT, HISD, 2018-2019**



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Career and Technical Education: Enrollment, Performance, Graduation, and Dropout, HISD, 2018–2019

Executive Summary

The State of Texas makes provision for students to be enrolled in career and technical education (CTE) courses including dual credit courses that would prepare them for occupations identified by local businesses to be in high demand. Knowledge of labor market projections is essential in the design of CTE programs of study (Houston ISD, 2018). CTE courses are offered either as a coherent or non-coherent sequence of courses. The Houston Independent School District (HISD) offers CTE courses in 16 career clusters in related work-based learning, education, and training through written agreements with business and industry training partners, and practicums from which career pathways can be developed. Career pathways are coherent, articulated sequences of rigorous academic CTE courses that commence in the ninth grade and lead to an associate degree, baccalaureate degree and beyond, industry-recognized certification, and/or licensure as defined by the Office of Vocational and Adult Education in 1999 (Houston ISD, 2018). Participation in these career pathways provides opportunities that lead to career and college readiness.

The purpose of this study was to determine the performance of CTE students enrolled in a coherent sequence of CTE courses. The study was guided by four questions and used descriptive statistics based on students' results on the 2019 State of Texas Assessments of Academic Readiness (STAAR) End-of-Course (EOC) exams. Students' graduation, dropout, and certification data were also analyzed as well as the demographic and educational attributes of students enrolled in CTE.

Key Findings

- There was an increase in the number of students who were enrolled in a coherent sequence of CTE courses between the 2017–2018 and 2018–2019 school years.
- When compared to their peers who were enrolled in a non-coherent sequence of CTE courses, a higher percentage of students who were enrolled in a coherent sequence of CTE courses were either Black (26.3% vs. 21.7%) or Hispanic (64.1% vs. 61.4%), G/T (17.5% vs. 13.3%), and economically disadvantaged (74.9% vs. 67.6%).
- Most students, between 64.0 percent and 91.9 percent, who were enrolled in a coherent sequence of CTE courses performed at or above the Approaches Grade Level standard on all five of the 2019 STAAR EOC exams. They also outperformed students who enrolled in a non-coherent sequence of CTE courses on four of the five STAAR EOC exams.
- A higher percentage of students who were enrolled in a coherent sequence of CTE courses in 2019 performed at or above the Approaches Grade Level standards on all five of the 2019 STAAR EOC exams compared to the performance of their 2018 peers on the 2018 STAAR EOC exams.
- Compared to the district (79.0%), a higher percentage of CTE students (87.8%) from the class of 2018 graduated from HISD, and, compared to the class of 2017 and the district, there was a larger increase in the number of CTE students from the class of 2018 (48.5% vs 4.8%) who graduated.
- Among ninth to twelfth-grade students, HISD had a higher dropout rate (4.3%) compared to the dropout rate for students who were enrolled in CTE (2.6%) during the 2017–2018 school year.

- On average, CTE participating schools had a certification pass rate of 82.7 percent during the 2018–2019 school year. Of these, six schools had pass rates of 100 percent while four performed below the district’s average.

Recommendations

- Given the performance, graduation, dropout, and certification pass rates, and based on the positive postsecondary effects of CTE enrollment demonstrated in the literature review, HISD students should be encouraged to enroll in a coherent sequence of CTE courses.
- It may be necessary to track students to determine how soon after graduation they enter the workforce, whether their choice of a career is compatible with their CTE career pathways, and to obtain information that will improve the designs of CTE programs of study.

Introduction

Section 134.006 of the Texas Education Code (2009) makes provision for career and technical education (CTE) programs to prepare high school students for “occupations identified by local businesses to be in high-demand” (p. 3042). The Code also provides for state grant funding along with district matching funds for the establishment of these programs. The Carl D. Perkins Vocational and Technical Education Act (1998) amended in 2006 also makes provision for the development of “academic and career and technical skills of secondary education students...who elect to enroll in career and technical education programs” (p. S.250-2).

All students in the Houston Independent School District (HISD) have equal access to CTE programs, services, and activities. HISD offers a non-coherent sequence of CTE courses or a coherent sequence of CTE courses or career pathways (Houston ISD, 2018). Career pathways are “coherent, articulated sequences of rigorous academic and career and technical education courses commencing in the ninth grade and leading to an associate degree, baccalaureate degree, and beyond, industry-recognized certification, and/or licensure and organized around sixteen career clusters” (Houston ISD, 2018, p. XX-5). The educational programs and curricula that define these clusters have been grouped by occupation and common knowledge and skills (Houston ISD, 2018). Career pathways provide a plan, area of focus, flexibility, variety, relevance, and support for students as they consider career goals and select high school and/or postsecondary courses for their career paths (Houston ISD, 2018).

The CTE program involves career preparation designed for students 16 years and older and provides work-based learning, education, and training through written agreements with a business and industry training partner. The program also offers a practicum, appropriate to students’ coherent sequence of courses and participation in CTE classroom instruction (Houston ISD, 2018). It involves project-based research that combines classroom instruction and supervised research, and rotation/preceptorship/internship which combines work-based education and training within students’ chosen careers and in which students “cycle all aspects of the industry/business to acquire full appreciation for the elements in the work-based environment” (Houston ISD, 2018, p. XX.7).

HISD offers 16 CTE programs at several high school locations (HISD, 2018). These are grouped as follows: (1) Agricultural; (2) Architecture, Construction, Manufacturing, and Transportation; (3) Science, Technology, Engineering, and Mathematics (STEM); (4) Communications and Information Technologies; (5) Business Operations, Management, and Hospitality; (6) Human and Social Services; and (7) Health Science. **Appendix A, Table A1**, pp. 16-18 lists the programs and the HISD schools where they were offered during the 2018–2019 school year, the associated certifications, and areas of potential employment.

The purpose of this study was to determine the enrollment, performance, and outcomes for students participating in CTE courses and specifically those enrolled in a coherent sequence of CTE courses. This is a descriptive evaluation that focuses on the key output of the CTE program, certification, as well as proxies like State of Texas Assessments of Academic Readiness (STAAR) End-of-Course (EOC) exam results, graduation, and dropout as program performance measures.

This study was guided by four key questions:

1. What were the 2009–2010 through 2018–2019 enrollment trends and the 2018–2019 demographic characteristics of students who were enrolled in HISD CTE programs?
2. What were the key CTE program initiatives implemented in HISD during the 2018–2019 academic year?
3. How did the performance of students enrolled in a coherent sequence of CTE courses compare with their non-CTE peers on the 2019 STAAR EOC assessments?

4. What were the longitudinal graduation and annual dropout rates for students enrolled in a coherent sequence of CTE courses compared to HISD students districtwide and students who graduated in the class of 2017 and 2018?

Literature Review

The growing emphasis on CTE, nationally, may be in response to concerns among industry leaders that students may not be acquiring the necessary labor or workforce entry skills (Jackson, Lower, & Rudman, 2016). Generally, research on CTE has been descriptive and focused on the enrollments and graduation figures, sometimes disaggregated by course or analyzed for differences in students' performance for a coherent sequence of courses and a non-coherent sequence or non-CTE courses. Recent studies have begun to address the academic and non-academic impacts of CTE programs.

Webb (2012) sought to compare graduation rates of CTE students to non-CTE students in Tennessee. The study used CTE and non-CTE students from 14 public school systems in the Upper Cumberland Region. It also looked at graduation variables regarding the effects of gender and socioeconomic status on CTE and non-CTE students' high school graduation. Still seen as second-rate education among students who will not enroll in postsecondary education upon graduation or who are college-bound (Webb, 2012), the study found that CTE concentrators graduated at a higher rate than non-concentrators, but there was no statistically significant difference that confirmed that CTE concentration was the reason for the higher graduation rate (Webb, 2012).

Students in two Title I Florida high school career-specific CTE programs were investigated to determine their level of preparation for and transition to an economic workplace (Neilson, 2016). The investigation found, among others, that students enrolled in CTE medical science academy programs at their school reported a high degree of career decision-making self-efficacy, and that students' learning and engagement supported their career growth and development (Neilson, 2016). The investigation involved 53 CTE Certified Nursing Assistant and Electrocardiogram Technicians.

Using correlations and t-tests, Moss's (2015) study on the postgraduation impact of CTE using data from four high schools in Missouri found large positive relationships between CTE programs and college placement, employment, or recent locations. However, the t-test results showed no statistically significant difference between placement for students who attended a district or area career and technical facility. The study analyzed four types of postgraduation placement, college placement, postsecondary vocational training, military, and no placement using annual graduation data between 2011–2013 (Moss, 2015).

CTE programs were shown to have a significantly higher level of students' engagement, with environments that were welcoming, warm and with caring adults (Eimers, 2017). Eimers (2017) surveyed CTE and non-CTE students using the Tripod 7C instrument and used focus groups to determine students' perceptions about CTE's impact on their engagement, mindset, teacher support, and school climate. The findings revealed a statistically significant difference between CTE and non-CTE students in the areas of care, captivate, and clarify (Eimers, 2017).

The studies in this review found higher graduation rates among CTE students and specifically, students enrolled in a coherent sequence of CTE courses. They also demonstrated superior non-academic skills like career decision-making and showed that CTE participation supported their career growth and development. There was, however, no statistically significant difference in the post-secondary placement of CTE and non-CTE students.

Method

This study used descriptive data to determine the association between CTE course enrollment and student performance, graduation, CTE certification, and annual dropout rates. HISD students enrolled in CTE

courses were identified in the Public Education Information Management System (PEIMS) and the Cognos data warehouse. Cognos is an IBM business intelligence and performance management software suite. PEIMS data were collected in the fall of 2017. Students enrolled in a non-coherent sequence of courses were coded 1 and those who were enrolled in a coherent sequence of courses were coded 2 in PEIMS and the data warehouse. PEIMS key demographic and educational data for these students, including gender, ethnicity and race, economically-disadvantaged, gifted and talented (G/T), and at-risk¹ statuses were also used in the analysis.

The 2018 State of Texas Assessments of Academic Readiness (STAAR) End-of-Course (EOC) exam scores were used as the outcome data. All students who had an Algebra I, Biology, English I, English II, or U.S. History STAAR EOC exam score on the Spring administration, 2018 were included in the study along with their met-standards status on these exams. Only regular STAAR was included. STAAR is a state-mandated criterion reference test that measures student academic performance and achievement. Retesters were not included in the study due to overexposure to both the courses and outcome measures. Students' STAAR data used in this study were retrieved from Cognos. The dataset was cleaned and organized for analyses. Non-CTE students were coded 0; students enrolled in a non-coherent sequence of courses were coded 1, and those enrolled in a coherent sequence of courses were coded 2 to facilitate the analyses (**Table B1, Appendix B**, p. 19).

Descriptive analyses were used to compare the CTE group's composition relative to the district by key demographic and educational data. Further analyses were conducted to determine the extent to which students in the study met STAAR standards based on the scale scores students attained on these EOC tests. The 2017–2018 standards were classified as follows:

1. Does not meet grade level.
2. Approaches Grade Level Standard (at the student performance standard applicable on the first EOC the student took).
3. Meets Grade Level standard.
4. Masters Grade Level standard.

Standards 2 to 4 above reflect passing standards on STAAR EOC exams. Students who attained Masters Grade Level Standard would have also attained Approaches Grade Level Standard at the students' performance standard and Meets Grade Level standard.

Data for students' CTE industry certification were retrieved from the HISD Chancery Ad Hoc package in the data warehouse through Cognos. Graduation data from the Research and Accountability Microsoft Access data files and CTE and HISD longitudinal graduation rates were obtained from the Texas Education Agency (TEA) 2017 Accountability Completion, and Graduation and Dropout Summary Report. The evaluation study also used the TEA 2016–2017 Annual Dropout Summary Report for CTE and HISD annual dropout rates.

Graduation data for the 2017–2018 cohort were collected from the Microsoft Access archived data. Dropout data were obtained from the Texas Education Agency (TEA) published sources. Both graduation and dropout data have a one-year reporting and publication lag.

Limitations

- CTE is not a program or instructional treatment but a coherent and non-coherent sequence of courses legislated by the State of Texas as options for students wishing to pursue careers in the state. Outcome data for these courses are restricted to dully-enrolled students. STAAR EOC exam results are proxy outcomes.

¹ At-risk indicates whether a student is currently at-risk for dropping out of school using state-defined criteria only. The student must be less than 21 years old and experiencing one or more of 13 criteria including unsatisfactory academic performance, retained in a grade, is pregnant or a parent, homeless, and prior expulsion (Texas Education Agency, 2018).

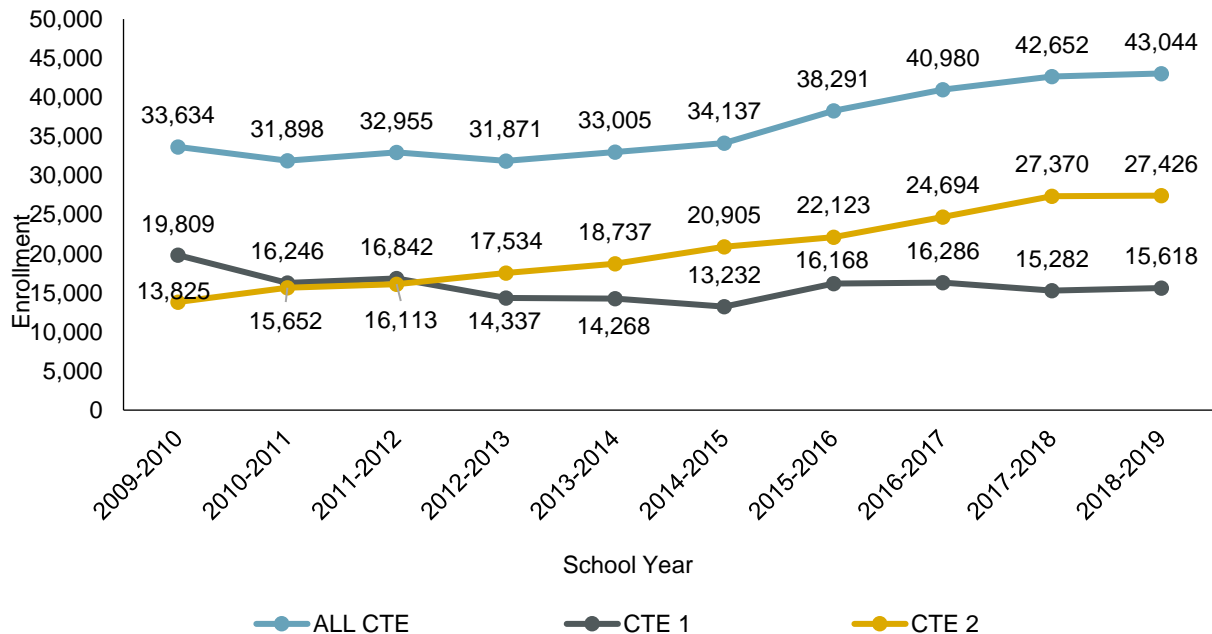
- Students self-enrolled into CTE courses posing a challenge for identifying students with similar motivation to enroll but who did not enroll in CTE courses as a viable comparison or control group for this report.
- Graduation data lag the current cohort of CTE students in this report. Related data used in this report do not refer to the 2018–2019 cohort of students, which presents a challenge for assessing the intended outcome of completing these courses.
- Data on certification are used, but it would take several years before it can be ascertained whether the 2018–2019 cohort of CTE students found employment or pursued higher education in their areas of study as reflected in the objective for offering these courses.
- STAAR EOC tests were administered after courses were completed. Although there are retesters, prior scores for those courses are unavailable. This restricts the robustness of the analyses that could be undertaken.

Results

What were the 2009–2010 through 2018–2019 enrollment trends and the 2018–2019 demographic characteristics of students who were enrolled in HISD CTE programs?

Figure 1 shows the comparative enrollment of CTE students in HISD between the 2009–2010 and 2018–2019 school years, inclusive.

Figure 1. Comparative CTE Course Enrollments in HISD, 2009–2010 to 2018–2019



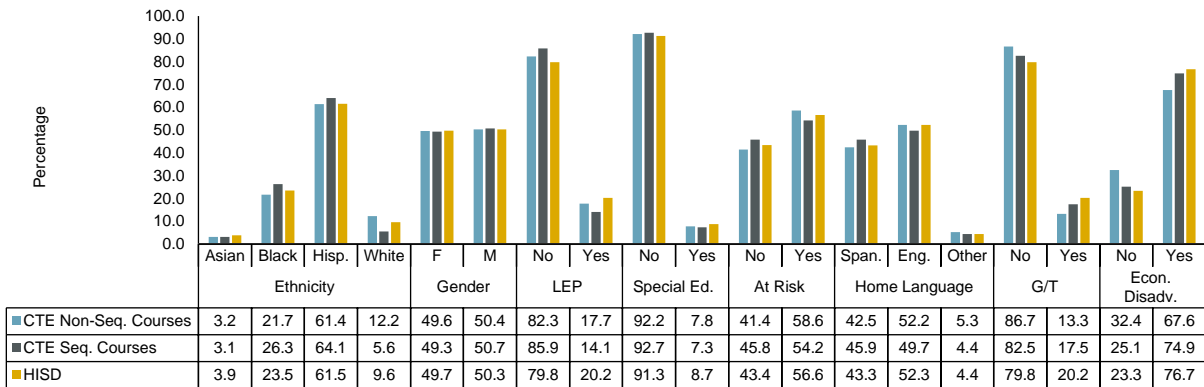
Source: PEIMS fall 2018 (Department of Research and Accountability database); HISD Report 2017–2018.

Note: CTE flags were revised in 2016–2017 to 0, 1 and 2 (See Appendix B, Table B1, p. 22); Figures from 2016–2017 reflect only Code 2 after the use of code 3 was discontinued. ADA-Eligibility code “0” has been excluded from the enrollments for 2018–2019.

- Overall, the number of students enrolled in a CTE course or a coherent sequence of courses increased by 392 from 42,652 in 2017–2018 to 43,044 in 2018–2019.
- The number of students enrolled in a non-coherent sequence of CTE courses (CTE1) increased from 15,282 in 2017–2018 to 15,618 in 2018–2019.
- The number of students enrolled in a coherent sequence of CTE courses (CTE2) increased from 27,370 in 2017–2018 to 27,426 in 2018–2019.

Figure 2 shows the demographic composition of students enrolled in CTE courses during the 2018–2019 school year.

Figure 2. Comparative Distribution of CTE and HISD 6–12th Grade Students by Demographic Groups, 2018–2019



Source: PEIMS Fall 2018 (HISD Department of Research & Accountability Microsoft Access Database), HISD SIS Ad Hoc data warehouse

Note: Fem. = Female; Seq. = Sequenced; Hisp. = Hispanic; LEP = Limited English Proficiency; Special Ed = Special Education; G/T = Gifted and talented; Span.= Spanish; Eng.= English. The total CTE Enrollment was N = 43,044, CTE Sequence enrollment was 27,426; and HISD 6th – 12th grade enrollment was 94,413.

- A higher percentage of Black and Hispanic students were enrolled in a coherent sequence of CTE courses compared to those who were enrolled in a non-coherent sequence of course in 2018–2019 (Figure 2).
- A lower percentage (5.6%) of White students were enrolled in a coherent sequence of CTE courses compared to those (12.2%) who were enrolled in a non-coherent sequence of CTE courses in 2018–2019.
- Lower percentages of LEP (14.1 vs. 17.7%) and at-risk (54.2 vs. 58.6%) students were enrolled in a coherent sequence of CTE courses compared to students enrolled in a non-coherent sequence of CTE courses during the 2018–2019 school year.
- Higher percentages of G/T (17.5 vs. 13.3%) and economically-disadvantaged (74.9 vs. 67.6%) students were enrolled in a coherent sequence of CTE courses compared to their peers who were enrolled in a non-coherent sequence of CTE courses during the 2018–2019 school year.

What were the key CTE program initiatives implemented in HISD during the 2018–2019 academic year?

Under the umbrella of the Career Readiness department, HISD provided career awareness and technical education experiences to students in the 2018–2019 school year. Some key initiatives included: Broadening Work-Based Learning Opportunities through Business Partnerships, Providing Career Awareness to Elementary Students, Increasing Career Exploration Experiences for Middle School Students, Providing teacher development support to CTE teachers to increase expertise, and increasing the number of CTE programs offering industry certifications.

In addition to these key initiatives, the Career Readiness department offered a variety of programs through Career and Technical Education (CTE) coursework from which students could select a career pathway of study. Career pathways guide students in course selection regardless of their abilities, talents, or desired levels of education. By taking CTE courses, students are given opportunities to participate in hands-on training within their career pathways of interest. As such, HISD students engage in opportunities to explore career options and prepare for the workforce and/or post-secondary education. Additionally, several campuses offered dual credit courses to enhance their CTE pathways. The initiatives ensure that all CTE students develop career awareness within their selected course of study and receive exposure to professional experiences to develop mastery, confidence, and leadership skills. The following provides additional details regarding key initiatives in Career Readiness:

Broadening Work-Based Learning Opportunities through Business Partnerships:

Business partnerships provide students with enriching learning experiences, including one-on-one mentoring and real-world work opportunities. CTE students are invited to participate in field trips, site visits, and internships at local businesses. These businesses recognize the need to expose local students to various aspects of the world of work and the importance of on-the-job training experiences. Such experiences in 2018–2019 included interning at several major hotel chains and offering an apprenticeship like programs through Texas Masonry Council, and Marek Construction. HISD business partners, including Gilbane Building Company, Century AC, Walgreens, San Jacinto Junior College, and many hospital affiliations continue to partner with district high schools to provide assistance such as paid and unpaid internships for students, classroom speakers, facility tours, and teacher externships.

Expansion of Industry-Based Certifications Offered

Students engaged in Career and Technical Education programs across the district are afforded the opportunity to take an Industry-Based Certification (IBC) intended to increase, enhance, and demonstrate knowledge and skills associated with each pathway of courses. In 2018–2019, the number of students earning TEA recognized industry-based certification, as part of the College, Career, and Military Readiness indicator for accountability, increased by 284.9%. Implementation of supplemental curriculum, credentialing, and accreditation of labs has increased to support the delivery and attainment of IBCs across the district.

Providing Career Awareness to Elementary Students:

HISD elementary school students are exposed to career exploration presentations to increase their career awareness and peak interest in various careers within the local labor market. The Career Ready Wagon provides students with interactive, hands-on demonstrations with information about various professions. Students also participate in activity stations and hands-on demonstrations that help them begin to develop connections between their skills, interests, and future career choices. In 2018–2019, the Career Ready

Wagon visited 36 elementary schools and engaged over 10,000 students in the Career Ready Wagon, a converted school bus filled with hands-on interactive stations in career exploration.

Increasing Career Exploration Experiences for Middle School Students:

In 2018–2019, HISD encouraged middle school enrollment in three hybrid courses: Professional Communications, Principles of Information Technology, and Principles of Applied Engineering. The courses are designed to provide high school level credit in Information Technology or Engineering, while at the same time providing a specific curriculum that allows students to explore their own interests and aptitude as related to careers. Students are then able to make more informed decisions about their high school and endorsement choices.

Providing Print and Online Resources for Students and their Families:

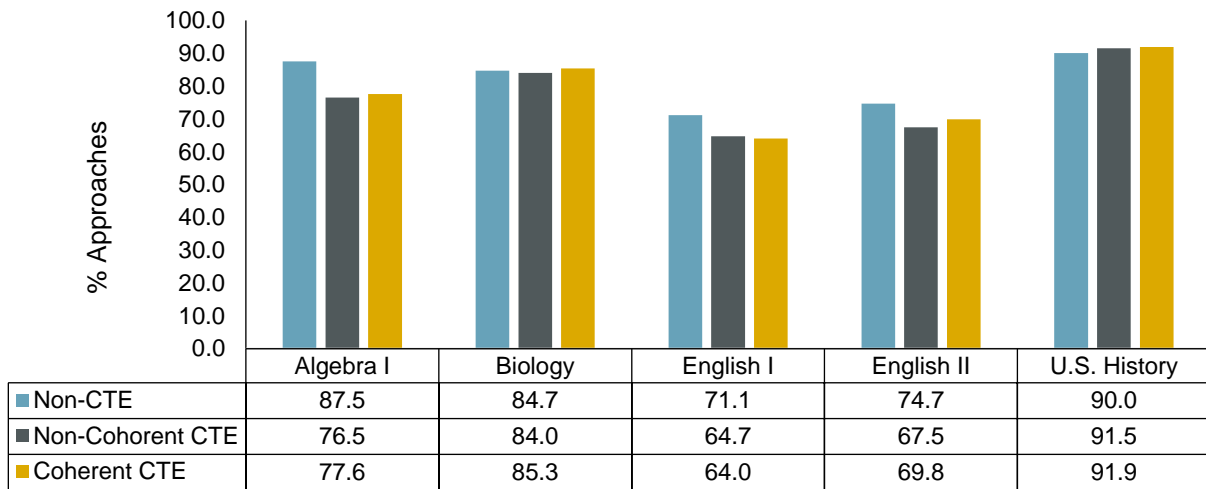
The Career Readiness Department maintains an engaging and up-to-date online platform (website) and provides printed and online career program materials (Career Program booklet) to better inform students, parents, teachers, and business partners about career programming throughout the district. The website presence is audience-driven and targets three audience groups through key functions: PLAN (Students and Families), PREPARE (Teachers), and PARTNER (Businesses). The site can be visited at the following link: <http://www.hisdcareerreadiness.org>. Information regarding descriptions of Career and Technical Education Programs of study available can be found at the following link: <http://www.hisdcareerreadiness.org/plan/programs/>

Career and Technology Student Organizations (CTSO)

CTE students are encouraged to join student organizations that are directly related to their selected career pathway. These organizations offer students opportunities to develop leadership and teamwork skills that help prepare them for the workforce and/or for postsecondary education and training. HISD has developed several partnerships with local, regional, and national professional organizations to allow school-level student organizations to participate fully in related activities of these organizations and to benefit from their professional memberships. Some of these organizations include the Business Professionals of America (BPA), Future Business Leaders of America (FBLA), Family, Career and Community Leaders of America (FCCLA), Health Occupations Students of America (HOSA), Skills USA, and the Technology Student Association (TSA). In the 2018–2019 school year, 2,797 students participated in district CTE student organization activities.

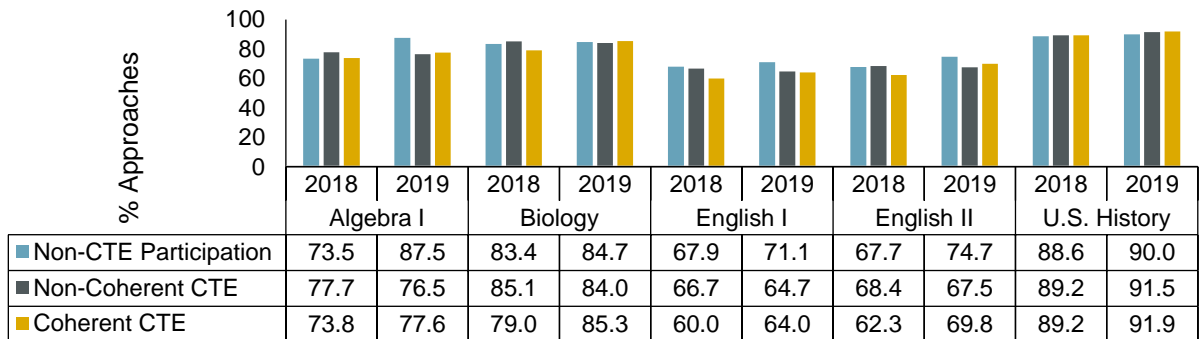
How did the performance of students enrolled in a coherent sequence of CTE courses compare with their non-CTE peers on the 2019 STAAR EOC assessments?

Figures 3 and 4 show the comparative performance of students enrolled in a coherent sequence and non-coherent sequence of CTE courses on the 2018 and 2019 STAAR EOC exams.

Figure 3. Comparative Percentage of HISD 9th- Through 12th-Grade Non-CTE and CTE Students Who Met or Surpassed Approaches Grade Level Standard on the 2019 STAAR EOC Exams

Source: HISD Department of Research & Accountability Microsoft Access STAAR EOC archived database

- A higher percentage of students enrolled in a coherent sequence of CTE courses performed at or above the Approaches Grade Level standard on the 2019 STAAR Biology (85.3%) and U.S. History (91.9%) EOC exams compared to students who were enrolled in either a non-coherent sequence of courses or who were not enrolled in any CTE courses.
- A higher percentage of students enrolled in a coherent sequence of CTE courses performed at or above the Approaches Grade Level standard on the 2019 STAAR Algebra I (77.6 vs. 76.5%), Biology (85.3 vs. 84.0%), English II (69.8 vs. 67.5%), and U.S. History (91.5 vs. 91.5%) EOC exams compared to students who were enrolled in a non-coherent sequence of CTE courses.

Figure 4. Comparative Percentage of HISD 9th- Through 12th-Grade Students by CTE Enrollments Status, who Performed at or Above the Approaches Grade Level Standard on the 2018 and 2019 STAAR EOC Assessments

Source: HISD Research & Accountability Microsoft Access STAAR EOC archived database

- A higher percentage of students enrolled in a coherent sequence of CTE courses in 2019 performed at or above the Approaches Grade Level standard on all five STAAR EOC exams compared to students

who were enrolled in similar courses in 2018. **Table C1** (**Appendix C**, p. 20) provides details on the number of STAAR students who were tested.

- A higher percentage of students enrolled in a non-coherent sequence of CTE courses in 2019 performed at or above the Approaches Grade Level standard on the STAAR U.S. History (91.5% vs. 89.2%) EOC exams compared to students were enrolled in similar courses in 2018.

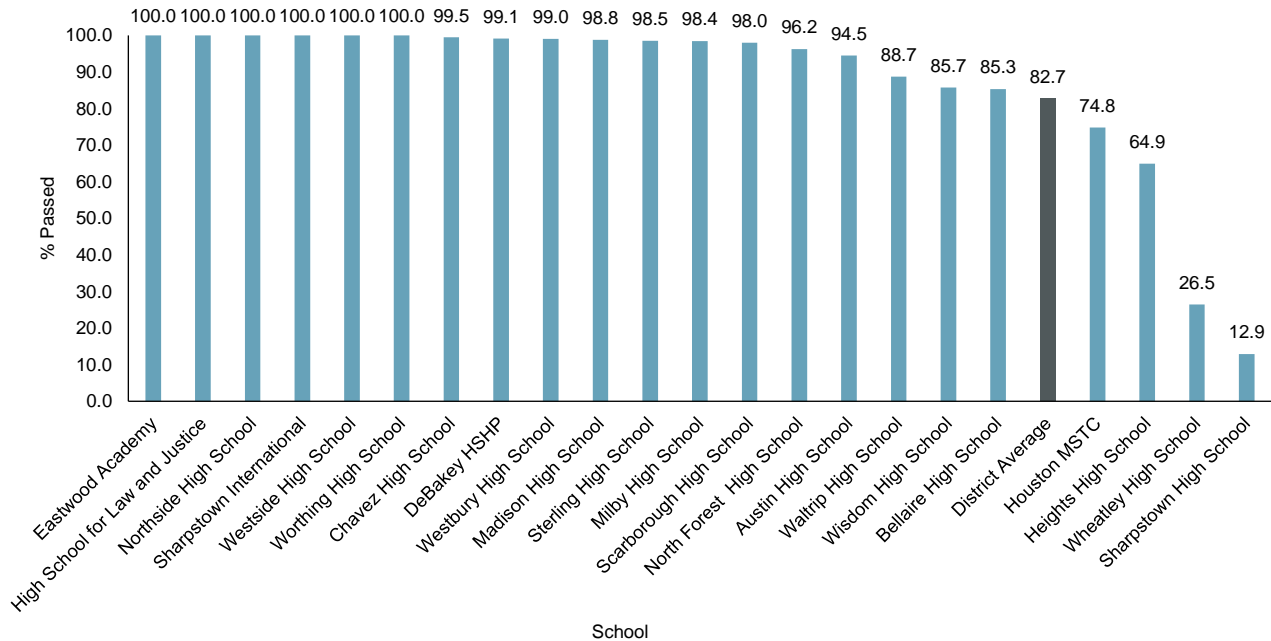
Table C2 (Appendix C, p. 21) shows the percentage of students who performed at or above the Approaches Grade Level standard on the 2019 STAAR EOC exams disaggregated by demographic and educational variables.

- Except for a few cases in Algebra I, and English I and II for limited English proficiency (LEP), special education, and at-risk students, most student groups enrolled in either a non-CTE or a coherent sequence of CTE courses, performed at or above the Approaches Grade Level standard on the 2019 STAAR EOC tests. Details are in Table C2 (Appendix C, p. 21).
- On the 2019 STAAR Biology, English I and II, and U.S. History EOC exams, selected student groups enrolled in a coherent sequence of CTE courses outperformed their peers who were not enrolled in any CTE courses. Details are in Table C2 (Appendix C, p. 21).

CTE Student Certification

Students could receive an industry certification, license, or Occupational Competency Assessment on successful completion of their CTE courses or programs. **Appendix D** (p. 22) describes the certifications. Students can also earn a performance acknowledgment on their high school diplomas for earning a nationally or internationally recognized business or industry certification or licensure (Houston ISD, 2019).

Data downloaded from Chancery Ad Hoc using IBM Cognos showed that 3,887 (82.7%) CTE certifications were earned among students in 22 HISD high schools. **Table D1** (p. 22) shows the type and distribution of certificates by schools. **Figure 5** shows the distribution of these certificates by school for students enrolled in the HISD CTE courses.

Figure 5. Distribution of Certifications Among HISD CTE Students by School, 2018–2019

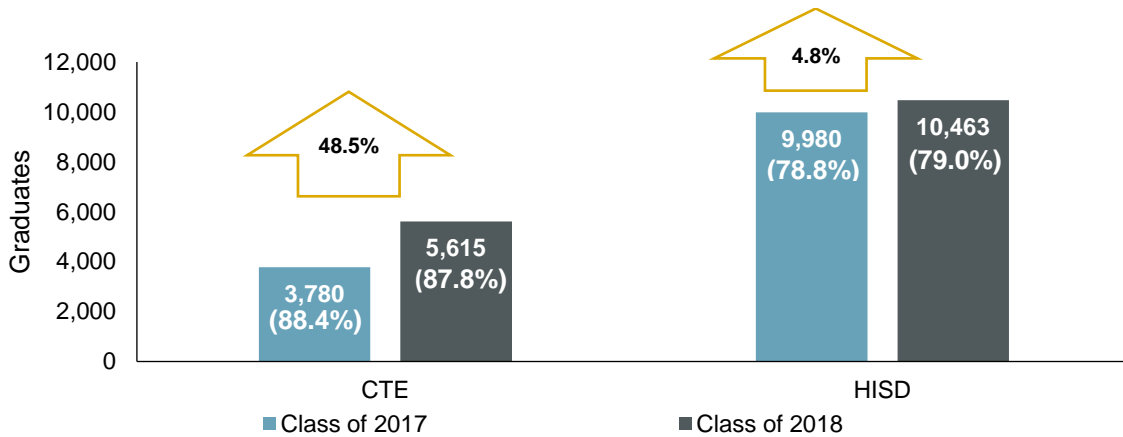
Source- Chancery Ad Hoc downloaded through IBM Cognos, 6/6/2019 (data only).

- The percentage of CTE certificates awarded in eighteen schools were higher than the district's average of 82.7 percent. Of these, six schools had a 100 percent CTE certification pass rate.
- The CTE certification pass rates for four schools were below the district's average.

What were the longitudinal graduation and annual dropout rates for students enrolled in a coherent sequence of CTE courses compared to HISD students districtwide and students who graduated in the class of 2017 and 2018?

Figure 6 and **Figure 7** show the longitudinal comparative graduation and the annual dropout rates for students enrolled in a coherent sequence of CTE courses. Students from the classes of 2017 and 2018 were compared. District data are provided for comparative purposes as well.

Figure 6. CTE and HISD Longitudinal Graduates Count Based on the Class of 2017 and Class of 2018

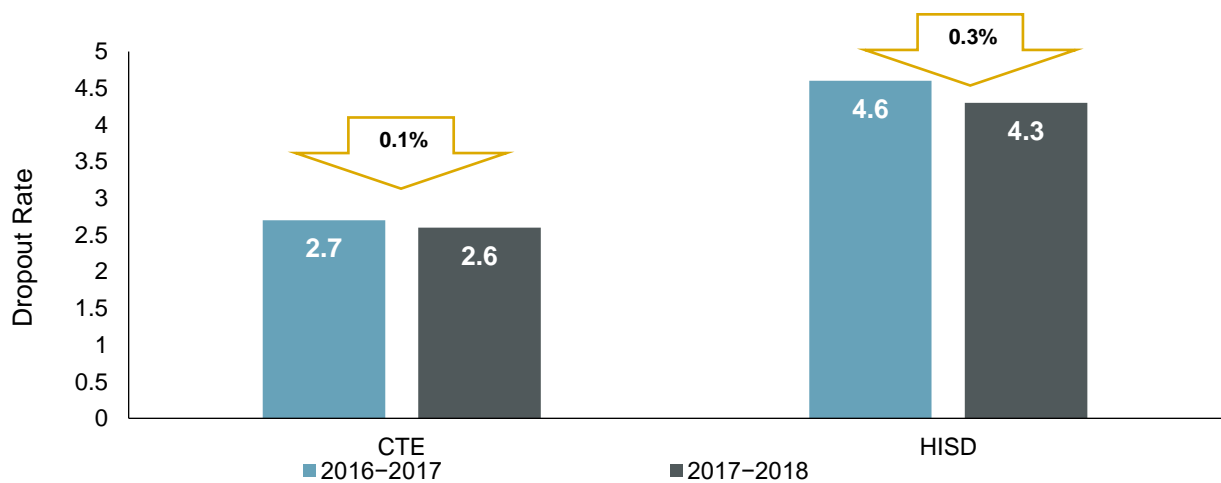


Source: TEA Class of 2017 and Class of 2018 Four-Year Longitudinal Summary Report.

Note: No statutory exclusions were applied. Data align with the State Performance-Based Monitoring Analysis System. Graduation rates are in parentheses

- The number of CTE students who graduated from the HISD class of 2018 increased by 48.5 percent over the number who graduated from the class of 2017 compared to a 4.8 percent increase for the district.
- While the four-year longitudinal graduation rate for the district was 79.0 percent, the graduate rate for students enrolled in a coherent sequence of CTE courses was 87.8 percent for the Class of 2018.
- The district showed a slight increase in its four-year longitudinal graduation rate from 2017 to 2018 while the students enrolled in the CTE coherent sequence cohort showed a slight decrease in the graduation rate over the same period.

Figure 7. CTE and HISD Annual Dropout Rates Ninth Through Twelfth Grade, 2016–2017 and 2017–2018



Source: TEA 2016–2017 and 2017–2018 Annual Dropout Summary Report

Note: No statutory exclusions were applied. Data align with the State Performance-Based Monitoring Analysis System.

- The dropout rate among students enrolled in a coherent sequence of CTE courses for the 2017–2018 school year (2.6%) remained considerably lower than the dropout rate for the district (4.3%) (see Figure 7, p. 13).
- The dropout rate for both the district and CTE coherent sequence cohorts decrease slightly (0.1 and 0.3%, respectively) between the 2016–2017 and 2018–2019 school years.

Graduation Diplomas

Based on the level and quality of credits acquired during high school, twelfth-grade students could have earned one of five types of diplomas for 2017 and 2018. These were completion of an Individualized Education Plan (IEP) Regular/Minimum, Recommended, Distinguished Achievement, and Foundation High School Program (**Table E1, Appendix E**, p. 23). District data were included for comparative purposes.

- Based on Table E1, most students enrolled in a coherent sequence of CTE courses graduated with Foundation High School Program diplomas (98.5%) in 2018. Districtwide, 95.1 percent of students graduated with similar diplomas in 2018.

Discussion

CTE continues to be a viable course option for students enrolled in HISD. Mandated by the Texas Education Code, students can enroll in a coherent and non-coherent sequence of CTE courses. The number of students enrolled in a coherent sequence of courses increased slightly from the 2017–2018 school year, while the number of students enrolled since the 2009–2010 school year has increased dramatically. During the last school year, over 43,000 HISD students were enrolled in a non-coherent or coherent sequence of CTE courses. The number of students enrolled in a coherent sequence of CTE courses continues to increase. Most students enrolled in a coherent sequence of CTE courses were either Black or Hispanic. Lower percentages of LEP and at-risk students and higher percentages of G/T and economically-disadvantaged students were enrolled in a coherent sequence of CTE courses compared to their peers who were enrolled in a non-coherent sequence of CTE courses.

The report indicates that most students enrolled in a coherent sequence of CTE courses met the Approaches Grade Level standard on all five of the 2019 STAAR EOC exams. They outperformed their peers who enrolled in a non-coherent sequence of CTE courses on the 2019 STAAR Algebra I, Biology, English II, and U.S. History EOC exams. A higher percentage of students enrolled in a coherent sequence of CTE courses performed at or above the Approaches Grade Level standard on all five of the 2019 STAAR EOC exams compared to their CTE peers' performance the previous year. An average of 82.7 percent of students earned an industry certification in a CTE course during the 2018–2019 school year.

The percentage of CTE students who graduated in 2017–2018 was 87.8 percent, which was slightly lower than the previous year (88.4%) but higher than the district's longitudinal graduation rate (79.0%) for the same period. CTE had a 48.5 percent increase in the number of students who graduated between the class of 2017 and the class of 2018. The district had an increase of 4.8 percent for the same period. The dropout rate among CTE students in 2017–2018 was considerably lower (2.6%) than the district's dropout rate among ninth to twelfth-grade students during the 2018–2019 school year, which was 4.3 percent.

It can be concluded that students enrolled in a coherent sequence of CTE courses are more likely to outperform their peers who were enrolled in a non-coherent sequence of CTE courses. Districtwide, students enrolled in a coherent sequence of CTE courses were more likely to graduate high school and less likely to drop out. Generally, students enrolled in a coherent sequence of CTE courses were likely Black or Hispanic, G/T, or economically disadvantaged. The likely standout was the G/T students since most students in the district are Black or Hispanic and economically disadvantaged. Encouraging more students to enroll in a coherent sequence of CTE courses appears to be one course of action that would improve student performance, the graduation rate, and reduce the dropout rate in HISD.

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Appendix A: CTE Pathways

Table A1. CTE Pathways, Career Opportunities, Certification, and Licensures Available to HISD Students, 2018–2019

CTE Pathways	High School Where Offered	Fast-Growing Career Opportunities	Certifications and Licensures
Agriculture, food and natural resources	Austin	Veterinary Technicians	Certified Veterinary Assistant (CVA Level 1) Texas Floral Design- Level 1 Certification
	Bellaire		
	Booker T. Washington	Agricultural Inspectors	
	Chavez		
	Harper Alternative School	Forest and Conservation Workers	
	Lamar		
	Madison		
Architecture and Construction	North Forest		
	Worthing		
	Barbara Jordan	Construction management	NCCER - Construction Technology
	Booker T. Washington		
	Furr	Civil Engineers	NCCER – HVAC
	Houston MTSC		
	Jones Futures	Heating and Cooling Technicians	NCCER- Plumbing
	Jordan		
	Lamar		
	Milby		AutoCAD - Certified Associate
Arts, A/V Technology & Communication	Scarborough		
	Waltrip		
	Wisdom		Certified SOLIDWORKS Associate (CSWA)
	Chavez	Audio/Visual Technicians	Adobe Certified Associate (ACA) Video communication
	Furr		
	Heights	Multimedia Artist and Animators	Adobe Certified Associate (ACA)- Visual Communication
	Jordan		
	Kashmere	Technical Writers	
	Lamar		
Business Management & Administration	Milby		
	Northside		Apple Final Cut Pro
	Sharpstown		
	Waltrip		
	Westside		
	Yates		
	Austin	Human Resource Specialist	Microsoft Office Certified Master
	Bellaire		
	Heights	Sales Agents and Managers	A*S*K Business Fundamental
	Houston Academy of International Studies	Market Research Analyst	NOCTI-Business
Education and Training Services	Lamar		
	Liberty		
	North Houston Early College		Sales Force
	Sterling		
	Westside		
	Wisdom		
	Austin	Teacher	Early Childhood Education Assessment and Certification
Education and Training Services		Coaches and Recreation Instructors	Pre-professional Certification in Education Fundamental
		Social Workers	

Table A1. CTE Pathways, Career Opportunities, Certification and Licensures Available to HISD Students, 2018–2019 (continued)

CTE Pathways	High School Where Offered	Fast-Growing Career Opportunities	Certifications and Licensures
Finance	Bellaire	Accountants and Financial Analyst	QuickBooks Certified Use
	Heights		
	High School for Law and Justice	Loan Clerks and Bank Officers	A*S*K Finance
	Lamar		
Government and Public Administration	Liberty	Financial Advisors	
	Sharpstown		
	Westbury		
	Westside		
Health Science	High School for Law and Justice	Foreign Service Officer	
		Political Science Teacher	
		Paralegal	
		Dental Assistant	Certified Clinical Medical Assistant (CCMA)
Hospitality and Tourism	Chavez	Biomedical Technician	Phlebotomy Technician Certification (CPT)
	DeBaKey	Registered Nurse	Certified patient Care Technician/Assistant (CPCT/A)
	Jones Futures		Pharmacy Technician Trainee
	Heights		Nursing Assisting Assessment (CNA)
Human Services	Long Futures		National Entry Level Dental Assistant (NELDA)
	Madison		
	Milby		
	Sharpstown		
Information Technology	Waltrip	Hotel manager	ServSafe Food Handlers
	Westbury	Chef and Head Cook	
	Westside	Food and Beverage Service Worker	
	Wheatley		
Human Services	Worthing	Massage Therapist	Texas Cosmetology Operator License
	Jordan	Spa Manager	
	Houston MTSC		
	Milby		
Information Technology	Austin	Computer Programmers	BISCI- Cabling Installation
	Bellaire	Computer Engineers	CompTIA – Strata, A+, Network+ Security+
	Booker T Washington	Database Administrators	Adobe Certified Associate– Web Authoring, Interactive Media
	Eastwood Academy		CIW–Web Design Specialist, Web Security Associate, Internet Business Associate
Information Technology	Heights		STARS Certification
	High School for Law and Justice		SPACE Certification
	Kinder High School for the Performing and Visual Arts		ESRI Technical Certification–
	Houston MTSC		Desktop
Information Technology	Lamar		MOS Word, Excel, PowerPoint, Access
	Madison		
	Mickey Leland		
	Milby		
Information Technology	North Forest		
	Northside		
	Scarborough		
	Sharpstown		
Information Technology	South Early		
	Waltrip		
	Westbury		
	Westside		
Information Technology	Wisdom		
	Wheatley		
	Worthing		

Table A1. CTE Pathways, Career Opportunities, Certification and Licensures Available to HISD Students, 2018–2019 (continued)

CTE Pathways	High School Where Offered	Fast-Growing Career Opportunities	Certifications and Licensures
Law, Public Safety, Corrections and Security	Chavez	Emergency Medical Technician	Texas Commission on Fire Prevention Certificate
	High School for Law and Justice		
	North Forest	Police Officer	State Emergency Medication (EMT) Certification
	Sterling		
	Waltrip	Paralegal	
Manufacturing	Westbury		
	Wisdom		
	Houston MTSC	Welder	Autodesk Certified User
	Jordan		Certified SOLIDWORKS Associate (CSWA)
	Madison	Machinist	NCCER–Welding AWS Certification
Marketing Sales and Service	Milby	Technician	
	Wisdom		
	Bellaire	Sales Agents and Managers	A*S*K–Marketing Fundamentals
	Jordan		
	Heights	Merchandisers	A*S*K Entrepreneurship
	Scarborough		
	Westbury	Retail Salespeople	National Retail Federation Customer Service and Sales
	Austin	Geological Technician	Certified Clinical Medical Assistant (CCMA)
	Chavez		
S.T.E.M.	Booker T. Washington	Geoscientist	
	Eastwood Academy		Autodesk Certified User
	Energy Institute	Engineer	Certified SOLIDWORKS Associate (CSWA)
	Furr		
	Heights		
	Houston MTSC		
	Kashmere		
	Lamar		
	Madison		
	Mickey Leland		
	Milby		
	Reagan		
	South East Early College		
	Waltrip		
	Westbury		
	Westside		
	Young Women's College Prep Academy		
Transportation, Distribution & Logistics	Austin	Merchant Mariner	ASE-Brakes, Electronic/Electrical Systems, Heating and A/C, Engine Repair
	Heights		
	Houston MTSC	Auto/Diesel Technician	
	Jordan		
	Madison	Airline Pilot	
	North Forest		CLA
	Sterling		
	Waltrip		CLT
	Westbury		
	Wheatley		GLA
	Yates		

Appendix B: CTE Codes

Table B1. Description of Career and Technical Education Codes, Texas Education Data Standards, 2018–2019				
Code Table ID	Name	XML Name	Date Issued	Date Updated
C142	CAREER-AND-TECHNICAL-ED-INFO-CD	TX-CareerAndTechnologyEdType	3/3/1993	3/1/2016
Code	Translation			
	When assigning the Career and Technical Indicator Code, include enrollment in all Career and Technical Education (CTE) courses, regardless of course funding weight			
0	Not Enrolled in a CTE Course			
1	Enrolled in A CTE Course: A student in grades 6-8 who is taking a CTE course as of the fall snapshot date or completed a CTE course by the end of the school year. A student in grades 9-12 who is taking a CTE course as of the fall snapshot date or completed a CTE course by the end of the school year and the student's 4-year plan of study does not outline a coherent sequence of courses in CTE			
	The following code is for students who on the fall snapshot date: (a) have a 4-year plan to take a coherent sequence (2 or more CTE courses for 3 or more credits) of courses in CTE, and (b) are enrolled in or have completed a semester of CTE course(s), which are part of their CTE coherent sequence of courses. If a student's 4-year plan changes, then the student could go from a code 2 to a 0 or 1 in a subsequent school year			
2	Participant in A Coherent Sequence of Courses: A student in grades 9-12 who is enrolled in a sequential course of study, which develops occupational knowledge, skills, and competencies relating to a CTE program of study. The student must have a 4-year plan of study to take 2 or more CTE courses for 3 or more credits			

Source. 2017–2018 Texas Education Data Standards, Section 4 Description of Codes, p. 4.118

Appendix C: STAAR Testers

Table C1. Number of STAAR Students Tested by EOC Subject and Evaluation Groups, HISD, Spring 2018 and 2019						
Subject	Non-CTE		CTE Non-Sequenced Courses		CTE Sequenced Courses	
	2018	2019	2018	2019	2018	2019
Algebra I	4,882	4,538	2,858	2,543	5,837	5,022
Biology	3,295	3,085	2,735	3,252	7,460	6,743
English I	3,161	2,779	2,687	3,259	7,384	6,411
English II	2,921	2,477	2,588	3,861	7,444	6,157
U.S. History	2,471	2,076	1,862	2,971	7,069	6,505

Source: HISD Student 2018–2019 PEIMS; STAAR EOC Spring Test Files, 2017 and 2018.

Note: Data are based on first-time, STAAR regular, and both online and paper administration.

Table C2. Percentage of HISD Non-CTE and CTE Coherent-Sequenced Students Who Performed At or Above Approaches Grade Level Standard on the 2019 STAAR EOC Exams, Disaggregated by Demographic and Educational Attributes

Demographic and Educational Variable		Non-CTE										Coherent CTE									
		Algebra I		Biology		English I		English II		U.S. History		Algebra I		Biology		English I		English II		U.S. History	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Ethnicity	Asian	247	98.4	244	99.2	219	95.6	204	92.7	161	95.3	61	92.4	169	93.9	162	87.6	163	87.2	200	92.6
	Blacks	627	85.4	380	83.0	277	66.1	263	69.2	318	88.1	1,264	80.1	1,618	86.0	1,104	61.2	1,070	67.0	1,489	92.5
	Hispanic	2,413	86.6	1,343	78.5	916	60.3	919	67.2	1,037	87.8	2,376	75.5	3,567	83.9	2,478	62.1	2,739	68.5	3,827	91.0
	White	596	89.0	569	96.0	508	92.2	417	90.8	316	96.3	158	87.3	329	93.2	303	85.4	282	88.1	407	97.4
Gender	Female	2,246	90.0	1,466	87.1	1,185	77.3	1,074	77.7	1,041	91.2	2,018	82.8	2,969	89.0	2,241	71.0	2,338	76.4	2,983	93.0
	Male	1,724	84.4	1,146	81.8	791	63.5	776	70.9	828	88.6	1,880	72.8	2,785	81.7	1,864	57.3	1,962	63.4	2,993	90.8
LEP	No	3,480	90.6	2,303	91.3	1,863	83.2	1,750	85.5	1,597	95.1	3,157	82.2	4,975	91.2	3,855	74.6	4,159	78.2	5,396	95.2
	Yes	490	70.4	309	54.9	113	21.0	100	23.3	272	68.7	741	62.6	779	60.6	250	20.1	141	16.9	580	69.2
Special Ed.	No	3,889	89.5	2,512	86.4	1,930	74.2	1,820	77.1	1,809	91.8	3,692	81.2	5,492	87.9	4,038	68.3	4,209	73.6	5,732	94.2
	Yes	81	42.0	100	56.2	46	26.0	30	26.1	60	57.1	206	43.6	262	52.9	67	13.5	91	20.6	244	58.4
At-Risk	No	2,718	96.9	1,542	97.8	1,226	94.0	1,104	95.1	1,028	99.0	1,582	95.2	2,789	98.0	2,364	89.5	2,433	91.6	3,009	99.0
	Yes	1,252	72.2	1,070	71.0	750	50.8	746	56.7	841	81.0	2,316	68.9	2,965	76.1	1,741	46.2	1,867	53.3	2,967	85.6
Home Language	Spanish	1,702	86.2	879	74.6	572	53.6	558	60.3	674	85.3	1,701	74.6	2,402	80.4	1,587	56.6	1,852	65.2	2,749	90.0
	English	1,960	87.9	1,507	90.7	1,218	82.1	1,156	84.4	1,057	94.2	2,011	79.7	3,022	89.2	2,259	69.4	2,276	74.1	3,003	94.0
	Other	308	92.8	226	92.6	186	81.6	136	74.3	138	84.1	186	85.3	330	88.9	259	73.4	172	70.5	224	87.8
Gifted & Talented	No	2,213	79.9	1,596	77.3	1,148	59.3	1,137	64.9	1,251	85.8	3,586	76.3	4,637	82.6	3,051	57.4	3,278	64.2	4,760	90.1
	Yes	1,757	99.4	1,016	99.5	828	98.2	713	98.3	618	100.0	312	96.6	1,117	99.2	1,054	96.1	1,022	97.2	1,216	99.6
Economically Disadvantaged	No	1,582	89.9	1,334	91.9	1,101	82.9	981	83.7	867	94.0	807	78.6	1,412	87.7	1,157	74.4	1,231	78.1	1,704	93.4
	Yes	2,388	85.9	1,278	78.3	875	60.3	869	66.6	1,002	86.8	3,091	77.4	4,342	84.6	2,948	60.7	3,069	67.0	4,272	91.3

Source: Chancery Ad hoc downloaded using Cognos on 6/; HISD Research and Accountability 2019 STAAR EOC Microsoft Access Archived dataset.

Note: The shaded light green highlights subgroups where 50 percent or more students by group performed at or above the Approaches Grade Level standard and the pink highlights showed student groups with less than 50% who performed at or above the Approached Grade Level standard. The darker green highlights areas where student groups enrolled in a coherent sequence of CTE courses outperformed their peers who were not enrolled in any CTE courses and who took the 2019 STAAR EOC exams.

Appendix D: CTE Certifications

Industry Certification

Industry certification is a credential that validates the ability to perform certain basic tasks essential to a specific industry. These certifications are usually created by a specific company such as ACA (Adobe Certified Associate).

License

A license is a Texas government-issued certificate that indicates completion of a training program with a minimum number of hours and successful acquisition of basic skills essential for specific trades or professions. Examples would be a state-issued Cosmetology license or a Licensed Pharmacy Technician Trainee.

Occupational Competency Assessment

An occupational competency assessment is a technical skills assessment created by groups such as the A*S*K Business Institute, which contends that the student has mastered job-ready technical knowledge. Examples include the A*S*K Business Fundamentals test (basic skills in Human Resources) and NCCER Welding.

Note: Other Houston ISD approved program-specific certifications, which are administered early for safety reasons or are needed to advance to the end of program certifications, are also available such as ServSafe; NCCER-Core; CPR- infant and adult; OSHA; MOS and so on.

Table D1. Distribution CTE Certification Results by School, HISD, 2018–2019			
School	N	Passed	% Passed
Eastwood Academy	219	219	100.0
High School for Law and Justice	86	86	100.0
Northside High School	20	20	100.0
Sharpstown International	40	40	100.0
Westside High School	105	105	100.0
Worthing High School	66	66	100.0
Chavez High School	188	187	99.5
DeBakey HSHP	231	229	99.1
Westbury High School	414	410	99.0
Madison High School	83	82	98.8
Sterling High School	203	200	98.5
Milby High School	64	63	98.4
Scarborough High School	102	100	98.0
North Forest High School	53	51	96.2
Austin High School	182	172	94.5
Waltrip High School	124	110	88.7
Wisdom High School	729	625	85.7
Bellaire High School	320	273	85.3
Houston MSTC	750	561	74.8
Heights High School	265	172	64.9
Wheatley High School	423	112	26.5
Sharpstown High School	31	4	12.9
Grand Total	4,698	3,887	82.7

Source: Chancery Ad Hoc downloaded 6/6/2019 using IBM Cognos (data only).

Appendix E: Graduation Diplomas

Table E1. Percent of CTE Graduates by Diploma Type, Spring, 2017 and 2018

	Type of Diploma	PEIMS Code	2017		2018	
			N	%	N	%
CTE Code 2	Completion of individualized Education Plan ¹	04, 05, 06, 07	71	1.1	4	0.07
	Regular/Minimum ¹	18, 19, 20, 21, 24, 27, 30	541	8.2	26	0.5
	Recommended	22, 25, 28, 31	5,021	76.4	45	0.08
	Distinguished Achievement	23, 26, 29, 32,	451	6.9	5	0.09
	Foundation High School Program	34, 35, 54, 55, 56, 57	488	7.4	5,415	98.5
HISD	Completion of individualized Education Plan	04, 05, 06, 07	210	2.0	102	0.9
	Regular/Minimum	18, 19, 20, 21, 24, 27, 30	1,169	11.0	174	1.6
	Recommended	22, 25, 28, 31	7,497	70.6	258	2.3
	Distinguished Achievement	23, 26, 29, 32,	758	7.1	11	0.1
	Foundation High School Program	34, 35, 54, 55, 56, 57	979	9.2	10,519	95.1

Totals (2018): CTE = 5,495; HISD = 11,064

Source: District and School Profiles, 2016–2017 and 2017–2018; HISD 2017–2018 Graduate File (Access); PEIMS 2016–2017 and 2017–2018 (Access).

Note: ¹Applies only to students receiving special education services. These students graduated in a minimum high school program under TAC Chapter 74 with curriculum content modifications through the student's individualized education program (IEP). No statutory exclusions for state accountability were applied.